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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of Kyusik Sin et al.		Ser. No:	09/828,635
Filing Date:	April 5, 2001	Examiner:	K. Bernatz
Atty. Docket No:	RR-1681	Technology Center:	1700

For: SPIN VALVE SENSORS HAVING SYNTHETIC ANTIFERROMAGNET FOR LONGITUDINAL BIAS

March 29, 2004

Mail Stop Appeal Brief
Commissioner for Patents
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REPLY BRIEF FOR APPELLANTS

This is a Reply Brief in response to the Examiner's Answer that was mailed January 27, 2004. An Appeal Brief was filed December 11, 2003.

Discussion

I. Claims 6, 7, and 17-20 are adequately enabled under 35 U.S.C. §112, first paragraph.

The Examiner's Answer states:

> These claims contain reference to a third non-magnetic layer and/or a fourth ferromagnetic layer in specific structural locations, yet the as-filed specification and Figures fail to describe a third non-magnetic layer and fourth ferromagnetic layer meeting the claimed structural limitations.

In response to the Examiner's assertion that the specification fails to describe a third non-magnetic layer, initially note that none of the claims on Appeal define first, second or third "non-magnetic" layers.

Also note that the Examiner asserts, for the first time in the Examiner's Answer (page 16, paragraph 11(i)) that:

> Nonferromagnetic is equivalent language to "nonmagnetic" and appellants have not defined "nonferromagnetic" to mean anything other than the common meaning that one of ordinary skill in the magnetic head art would normally utilize.

Appellants respectfully assert that this is incorrect. For example, Appellants respectfully assert that the term "paramagnetic" is used to describe materials that are "nonferromagnetic" but not "non-magnetic" or "nonmagnetic," as is well known by those of ordinary skill in the art. Other types of materials that are known to be nonferromagnetic but not nonmagnetic include antiferromagnetic, ferrimagnetic and asperomagnetic materials, for example.

Appellants are also surprised that:

> the Examiner notes that appellants refer to the antiferromagnetic layer in Figure 3 (layer 102) as a "nonferromagnetic layer" (Brief, page 4), which is repugnant to the definition one of ordinary skill in the art would give to "ferromagnetic."

Appellants, each of whom has an advanced degree and many years of experience in the design and fabrication of magnetic heads, find it curious that the Examiner asserts that one of ordinary skill would find Appellants' choice of words "repugnant." As noted above, the Examiner seems to have a rather simplistic understanding that is limited to a single form of magnetism.

Further note that independent claim 17 recites "a nonferromagnetic, electrically conductive layer adjoining said third ferromagnetic layer distal to said first and second ferromagnetic layers," and does not recite additional "nonferromagnetic," "non-magnetic" or "nonmagnetic" layers. In total, Claim 17 recites:

> A sensor comprising:
>
> first and second ferromagnetic layers that are disposed substantially in a plane,
>
> a third ferromagnetic layer that is not disposed in said plane, said third ferromagnetic layer having a first portion disposed adjacent to said first ferromagnetic layer, a second portion disposed adjacent to said second ferromagnetic layer and a third portion disposed between said first and second portions and distal to said first and second ferromagnetic layers,
>
> a nonferromagnetic, electrically conductive layer adjoining said third ferromagnetic layer distal to said first and second ferromagnetic layers, and

a fourth ferromagnetic layer adjoining said conductive layer,

wherein said fourth ferromagnetic layer has a magnetic moment that is fixed in the presence of an applied magnetic field, said first and second portions of said third ferromagnetic layer have magnetic moments that are fixed in the presence of said applied magnetic field and said third portion of said third ferromagnetic layer has a magnetic moment that varies in response to said applied magnetic field.

Support for claim 17 can be found, for example, in FIG. 6 and corresponding text. For instance, layer 203 may be a first ferromagnetic layer (see, e.g., paragraph [0029]), layer 205 may be a second ferromagnetic layer (see, e.g., paragraph [0029]), layer 206 may be a third ferromagnetic layer (see, e.g., paragraph [0029]), and layer 210 may be a fourth ferromagnetic layer (see, e.g., paragraph [0030]). Moreover, layer 208 may be "a nonferromagnetic, electrically conductive layer adjoining said third ferromagnetic layer distal to said first and second ferromagnetic layer" (see, e.g., paragraph [0030]). Claim 17 is thus clearly enabled and not indefinite.

Claim 18 recites:

The sensor of claim 17, further comprising first and second nonferromagnetic, electrically conductive exchange coupling layers adjoining said first and second ferromagnetic layers and said third ferromagnetic layer.

As noted in paragraph [0029] of the specification:

Alternatively, instead of employing a hard magnet for biasing, layers 202 may be antiferromagnetic and layers 203 may be formed of a ferromagnetic bias layer and an electrically conductive, nonferromagnetic exchange coupling layer, on which the free layer may be formed and coupled to the bias layer.

Thus, for example, layers 203 and 205 can include "first and second nonferromagnetic, electrically conductive exchange coupling layers adjoining said first and second ferromagnetic layers and said third ferromagnetic layer," as recited in claim 18.

Claim 19 recites:

The sensor of claim 18, wherein said exchange coupling layers include ruthenium, iridium or rhodium.

As noted in paragraph [0017] and paragraph [0019] of the specification, such an exchange coupling layer can be made of ruthenium (Ru), iridium (Ir) or rhodium (Rh).

Claim 6 recites:

> The sensor of claim 1, further comprising a fourth ferromagnetic layer and a third nonferromagnetic layer, wherein said third nonferromagnetic layer adjoins said third and fourth ferromagnetic layers.

Support for claim 6 can be found, for example, in FIG. 6 and corresponding text. For example, layer 214 may be a first ferromagnetic layer (see, e.g., paragraph [0030]), layer 210 may be a second ferromagnetic layer (see, e.g., paragraph [0030]), layer 206 may be a third ferromagnetic layer (see, e.g., paragraph [0029]), and layer 203 may include a fourth ferromagnetic layer (see, e.g., paragraph [0029]), and layer 205 may be a fourth ferromagnetic layer (see, e.g., paragraph [0029]). Moreover, layer 212 may be a first nonferromagnetic layer (see, e.g., paragraph [0030]), layer 208 may be a second nonferromagnetic layer (see, e.g., paragraph [0030]), and the "nonferromagnetic exchange coupling layer" portion of layer 203 may be a third nonferromagnetic layer (see, e.g., paragraph [0029]), such that the "first, second and third ferromagnetic layers" "are interleaved with (the) first and second nonferromagnetic layers," and the "third nonferromagnetic layer adjoins said third and fourth ferromagnetic layers." Claim 6 is thus clearly enabled and not indefinite.

Claim 7 recites:

> The sensor of claim 6, further comprising an antiferromagnetic layer adjoining at least one of said first and fourth ferromagnetic layers.

Layer 202 may be an antiferromagnetic layer (see, e.g., paragraph [0029]) that adjoins the ferromagnetic portion of layer 203. Therefore, claim 7 is enabled and not indefinite.

II. Claims 17-20 are not indefinite for failing to particularly point out and distinctly claim the subject matter which appellants regard as the invention under 35 U.S.C. §112, second paragraph.

The Examiner's Answer states:

> Claims 17-20 are incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap

between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relative locations of the ferromagnetic layers, ferromagnetic "portions", and the non-magnetic layers, since the terms "distal" and "first and second ferromagnetic layers" in the claims are vague and indefinite when considered in view of the as-filed disclosure.

MPEP § 2172.01, which is cited in the Examiner's Answer, states:

> A claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may be rejected under 35 U.S.C. 112, first paragraph, as not enabling. *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). See also MPEP § 2164.08(c). Such essential matter may include missing elements, steps or necessary structural cooperative relationships of elements described by the applicant(s) as necessary to practice the invention.

MPEP § 2164.08(c), which is cited in MPEP § 2172.01, states:

> A feature which is taught as critical in a specification and is not recited in the claims should result in a rejection of such claim under the enablement provision section of 35 U.S.C. 112. See *In re Mayhew*, 527 F.2d 1229, 1233, 188 USPQ 356, 358 (CCPA 1976). In determining whether an unclaimed feature is critical, the entire disclosure must be considered. Features which are merely preferred are not to be considered critical. In re Goffe, 542 F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976).
>
> Limiting an applicant to the preferred materials in the absence of limiting prior art would not serve the constitutional purpose of promoting the progress in the useful arts. Therefore, an enablement rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended. Broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality.

In re Mayhew, which is cited in MPEP § 2172.01 and MPEP § 2164.08(c), likewise makes clear that Mayhew's own specification described only one mode of operation, and described that mode as necessary.

In contrast note that Appellants have not stated in the specification that any matter is "essential" or "critical" or "necessary" to the invention.

Moreover, the specification offers differing examples and embodiments that can fit within the definition of claim 17. One such description is listed above with reference

to FIG. 6. Further support for claim 17 can be found, for example, in FIG. 3 and the corresponding text. For instance, layer 111 may be a first ferromagnetic layer (see, e.g., paragraph [0019]), layer 112 may be a second ferromagnetic layer (see, e.g., paragraph [0019]), layer 108 may be a third ferromagnetic layer (see, e.g., paragraph [0018]), and layer 104 may be a fourth ferromagnetic layer (see, e.g., paragraph [0018]). Moreover, layer 106 may be "a nonferromagnetic, electrically conductive layer adjoining said third ferromagnetic layer distal to said first and second ferromagnetic layer" (see, e.g., paragraph [0018]).

The Examiner argues instead that arbitrary numbering of layers must be the same in the claims as in the specification, even though the text corresponding to FIG. 3 offers a different layer numbering than that corresponding to FIG. 6. Ironically, as noted below, the Examiner seems to have no restraint in asserting that various and sundry elements (e.g., "Ru, Ir, Rh and Cu"), structures (e.g., "first and third ferromagnetic layers having perpendicular magnetic moments or opposite magnetic moments;" "hard magnetic layers and antiferromagnetic layers") or devices (e.g., "spin valve sensors") are "equivalent" to each other to create an obviousness rejection.

Appellants have previously inserted into claim 17 one definition of "distal" provided by the Examiner to show that claims 17-20 are not indefinite, and the Examiner has not objected to that definition. The rejection of claims 17-20 on 112 second paragraph grounds seems to instead revolve around the Examiner's insistence that a layer labeled with an arbitrary number in one embodiment of the specification must be labeled with the same number in every claim. Appellants respectfully disagree.

> That claims are interpreted in light of the specification does not mean that everything expressed in the specification must be read into all the claims. On the contrary, as was said in *Environmental Designs*, supra, 713 F.2d at 699, 218 USPQ at 871:
>
> "[T]he specification must be sufficiently explicit and complete to enable one skilled in the art to practice the invention, while a claim defines only that which the patentee regards as his invention. 35 U.S.C. §112. The claim, not the specification, measures the invention. (Case cited). The argument that claim 1 must include a limitation found in the specification is thus legally unsound."

Raytheon Co. v. Roper Corp., 220 USPQ 592, 597 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 835 (1984).

One of ordinary skill in the art would readily understand that labels such as "first" and "second" are general terms and do not require a particular order, in the specification or claims, unless so stated.

III. Claims 1-5, 10-14 and 16 are not unpatentable under 35 U.S.C. §103(a) as being obvious over U.S. Patent Number 5,991,125 to Iwasaki et al. in view of U.S. Patent Number 6,496,338 to Hasegawa et al.

Appellants initially note that the Examiner's Answers attempts to disguise the 'obviousness by inherency' argument of the Final Rejection, in which he asserts that limitations absent from the prior art "Would have been inherently present because the claimed and prior art products are substantially identical in structure, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product." Instead, the Examiner's Answer states that a number of claimed properties "would appear to be met by the above structure." Whether there is any difference between alleging that those properties "would have been inherently present" and "would appear to be met by the above structure," is unclear, however. Therefore, Appellants reiterate the argument and legal authority cited in the Appeal Brief that demonstrates that the Examiner has mischaracterized the authority he cited to apply an incorrect standard of obviousness.

The fallacy of both the "inherently present" and "appear to be met" statements is illustrated by the Examiner's Answer. According to the Examiner's Answer, 'element 11 of FIG. 21 of Iwasaki et al. is a "free" magnetic layer.' Therefore, according to the Examiner's Answer, element 11 is not pinned by the layers above it, such as layers 12 and 13. *Assuming arguendo* that one of ordinary skill in the art would have modified "the device of Iwasaki et al. to form the layers above the free magnetic layer *(Iwasaki et al. - element* 11) such that they are only over the outer portion of the free magnetic layer," as proposed in the Examiner's Answer, Appellants respectfully assert that the outer portion of the free magnetic layer would not magically change from free to pinned. For at least this reason, the Examiner has failed to present a prima facie case of obviousness.

In addition, as noted in the Appeal Brief, one of ordinary skill in the art would have recognized several significant disincentives to making the modification proposed by the Final Rejection. The Examiner's Answer does not offer any reasoning to rebut these disincentives. Instead, the Examiner's Answer merely restates the Examiners opinion that "there is sufficient teaching in the prior art that such a structure would meet appellants' claimed limitations and appellants have provided no *evidence* of record supporting their alleged position." For this reason also, the Examiner has failed to present a prima facie case of obviousness.

The Examiner has the burden of presenting a prima facie case of obviousness. In re Fritch, 23 USPQ 2d 1780, 1783 (Fed. Cir. 1992). Absent the Examiner presenting such a case, there is no need for Appellants to present *evidence* to support their position.

Regarding claims 10 and 16, the Examiner's Answer states:

> Iwasaki et al. disclose the equivalents of using a structure where the first and third ferromagnetic layers have magnetic moments meeting appellants' claimed limitations (Figure 14B compared to Figures 21 and 22). Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, first and third ferromagnetic layers having perpendicular magnetic moments or opposite magnetic moments are equivalents in the field of multi-layered spin valve sensors. *In re Fount* (*sic*) 213 USPQ 532 (CCPA 1982); *In re Siebentrit* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Initially note that *Graver Tank* involves the Doctrine of Equivalents in an infringement context, as opposed to substitution of equivalents to allege obviousness, as proposed by the Examiner. Perhaps the Examiner finds infringement "equivalent" to obviousness, by analogy to his multiple assertions that various different structures and elements are "equivalents," or perhaps the Examiner believes that obviousness is inherent in infringement. In any event, citing *Graver Tank* to support the Examiner's obviousness rejection is a mischaracterization of that case.

In re Siebentrit and *In re Fout* turn on an admission of equivalents by the applicant. In *Siebentrit* the Appellant admitted the substantial similarity of his process and prior art processes. In *Fout* the admission came in the form of a Jepson preamble to a claim. There is no such admission in the present case. In contrast, Appellants respectfully assert that one of ordinary skill in the art would strongly disagree with the

Examiner's assertion that "first and third ferromagnetic layers having perpendicular magnetic moments or opposite magnetic moments are equivalents in the field of multi-layered spin valve sensors." Even if, *assuming arguendo*, perpendicular magnetic moments and opposite magnetic moments were equivalents, note that components which are functionally or mechanically equivalent are not necessarily obvious in view of one another. Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980). As stated in In re Geiger, 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987):

> At best, in view of these disclosures, one skilled in the art might find it obvious to try various combinations of these known scale and corrosion prevention agents. However, this is not the standard of 35 U.S.C. §103.

For these reasons also the Examiner has failed to present a prima facie case of obviousness. Thus, the Examiner has failed to show that one of ordinary skill in the art would have made the modification the Examiner proposes, failed to rebut Appellants' reasons why multiple disincentives would have been apparent to one of such skill to make the modifications the Examiner proposes, and failed to show that if such modifications would have been made, the claims on Appeal would not have nonobvious differences over the resulting device. The Examiner has mischaracterized as well as misapplied the law. In short, the Examiner has not presented a prima facie case of obviousness of claims 1-5, 10-14 and 16.

IV. Claims 6, 7, and 9 are not unpatentable under 35 U.S.C. §103(a) as being obvious over U.S. Patent Number 5,991,125 to Iwasaki et al. in view of U.S. Patent Number 6,496,338 to Hasegawa et al. and U.S. Patent Number 6,396,734 to Ishikawa et al.

The Examiner's Answer merely restates the Final Rejection of these claims. The Appeal Brief gave reasons why this proposed modification would not have been attempted by one of ordinary skill in the art, and reasons why this proposed modification would not work if it have been attempted.

The Examiner does not rebut Appellants' reasoning. Instead, the Examiner acknowledges Appellants' reasoning but states that "appellants have provided no *evidence* of record supporting the alleged position." It would be an interesting world if examiners could simply propose things that would not have been attempted by one of

ordinary skill in the art, and which would not work if they had been attempted, and a patent applicant would have to provide *evidence* to support the applicant's position. Thankfully, this is not the law.

V. Claims 8 and 15 are not unpatentable under 35 U.S.C. §103(a) as being obvious over U.S. Patent Number 5,991,125 to Iwasaki et al. in view of U.S. Patent Number 6,496,338 to Hasegawa et al. and U.S. Patent Number 5,995,338 to Watenabe et al.

The Examiner's Answer reiterates the Final Rejection of these claims. That rejection states, in part:

> However, the claimed limitations are known equivalents to Cu (used by Iwasaki et al.), as taught by Watenabe et al. (col. 8, lines 33-37).
>
> Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, Cu, Ru, Rh and Ir are equivalents in the field of nonmagnetic conductive elements for nonmagnetic conductive layers in sensors. *In re Fount* (*sic*) 213 USPQ 532 (CCPA 1982); *In re Siebrentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

In other words, the Examiner again relies on his interpretation of "equivalents," and again mischaracterizes and misapplies the law relating thereto. As stated on page 21 of the Examiner's Answer:

> The Examiner notes that Watenabe et al. contains an explicit statement that "as the aforementioned non-magnetic conductive film, it is preferable to use Au, Ag, Cu; otherwise, Cr, Pt, Pd, Ru, Rh etc., or their alloy may be used.

Thus, according to the Examiner, Au, Ag, Cu, Cr, Pt, Pd, Ru, Rh and, of course, etc. or their alloy, are all "equivalents in the field of nonmagnetic conductive elements for nonmagnetic conductive layers in sensors." Appellants respectfully assert that one of ordinary skill in the art would find this statement preposterous.

VI. Claims 1-4, 10-12, 14 and 16 are not unpatentable under 35 U.S.C. §103(a) as being obvious over U.S. Patent Number 6,122,151 to Saito et al. in view of U.S. Patent Number 5,910,868 to Kurosawa et al. and U.S. Patent Number 5,995,338 to Watanabe et al.

Again the Examiner relies on an alleged equivalent to obviate the need for an incentive to somehow combine or modify the cited references to arrive at the claims at issue. In addition, as noted in the Appeal Brief, even after mischaracterizing and misapplying the law in this fashion, other material limitations of independent claims 1 and 11, for example, are still absent from the proposedly combined or modified references. For all these reasons the Examiner has failed to state a prima facie case of obviousness in the rejection of these claims.

For this rejection, the Examiner begins by alleging not one but two equivalents. First, the Examiner states that Saito et al. product is substantially identical in structure to the claimed product. Then, the Examiner states that the hard bias layers of Saito et al. "are known equivalents to the antiferromagnetic bias layers used by appellants." Why not simply state that all magnetic heads are "equivalents," and do away with any need to follow the rules of obviousness?

The Examiners' Answer admits that that a number of claimed limitations are absent from his proposed combination or modification. In addition to the elements that the Office Action note are absent from the cited references, Saito et al. do not disclose a "second nonferromagnetic layer adjoining said second and third ferromagnetic layers" as recited in claim 1. For this reason Saito et al. in view of Watanabe et al. is not "substantially identical" or "equivalent" to claim 1, in contrast to the Office Action assertions. Therefore, all of the limitations alleged by the Final Rejection to be inherent in Saito et al. would not have been inherent, even if *assuming arguendo*, one were to accept the Examiner's statement of the law of obviousness by inherency. As previously noted, however, the Final Rejection alleges inherency to create an obviousness rejection with multiple references, and for this reason also the Final Rejection's legal basis is flawed.

In response to this reasoning, the Examiner's Answer states:

> Appellants argue that since Saito et al. alone does not disclose a "second nonferromagnetic layer" that Saito et al. is not substantially identical to the claimed invention and therefore cannot possess the claimed properties.

This is a mischaracterization of what Appellants said as well as a misunderstanding of the law. Appellants said that Saito et al. do not disclose a "second

nonferromagnetic layer adjoining said second and third ferromagnetic layers" as recited in claim 1. Appellants did not say that Saito et al. alone does not disclose a "second nonferromagnetic layer." Moreover, Appellants did not state that Saito et al. "therefore cannot possess the claimed properties." On the contrary, Appellants do not need to prove that the prior art cannot possibly posses the claimed properties. The burden is instead on the Examiner to prove that the prior art does possess the claimed properties since the Examiner is alleging the properties are inherent. Even if such a proof were made by the Examiner, which it was not, that which may be inherent is not necessarily obvious. In re Spormann, 150 USPQ 449, 452 (CCPA 1966).

The Examiner states that it would have been obvious in view of Kurosawa et al. to modify the device of Saito et al. in view of Watanabe et al. to form a second non-magnetic layer between the second and third ferromagnetic layers to improve the Hua of an antiferromagnetic bias layer deposited on the third ferromagnetic layer.

Were that modification to happen, Appellants respectfully assert that the resulting device would not, in contrast to claim 1 for instance, include a second ferromagnetic layer having a free portion and a fixed portion, as the "underlying Ta layer" of Kurosawa et al. would break the "ferromagnetic coupling at the interface between the ferromagnetic layer 10 and the hard bias layer 5" (column 5, lines 1-2) of Saito et al. Because of that "ferromagnetic coupling" ... "at the interface between between the ferromagnetic layer 10 and the free magnetic layer 4 in the T3 region, the free magnetic layer 4 is easily and properly put into a single domain state" (column 5, lines 1-6). The Examiner's proposal runs counter to this teaching of Saito et al.

The Examiner's Answer, however, on page 23, lines 13-15, states:

> The Examiner notes that the ferromagnetic bias layer (*Saito et al., Figure 3 – element 10*) is exchange coupled to a portion of said free layer (*element 4*) by a nonferromagnetic layer (*Ta layer motivated by Kurosawa et al.*).

Appellants respectfully but strongly disagree. Kurosawa et al. do not teach that their tantalum underlayer is an exchange coupling layer. In contrast, Kurosawa et al. show in FIG. 13 a Ta layer 9 spaced between a MR layer 3 and a SAL layer 8. Should the Ta layer 9 exchange couple MR layer 3 to SAL layer 8, the device shown in FIG. 13 of Kurosawa et al. would not work. Appellants note that the Examiner has not provided

any reference that teaches that tantalum can be used as an exchange coupling layer between ferromagnetic layers, and Appellants respectfully assert Ta is not known by one of ordinary skill in the art as an exchange coupling layer.

In short, the modification proposed by the Examiner would not have been attempted by one of ordinary skill in the art, as it would undermine an object of the Saito et al. disclosure, and *assuming arguendo* that such modification would have been made, the resulting device would be substantially different than the claims on Appeal. Further, the Examiner has not provided a reference that teaches that tantalum can be used as an exchange coupling layer as the Examiner asserts. For at least these reasons, the Final Rejection has not provided a prima facie case of obviousness of claims 1-4, 10-12, 14 and 16 over U.S. Patent Number 6,122,151 to Saito et al. in view of U.S. Patent Number 5,910,868 to Kurosawa et al. and U.S. Patent Number 5,995,338 to Watanabe et al.

VII. Claims 5 and 13 are not unpatentable under 35 U.S.C. §103(a) as being obvious over U.S. Patent Number 6,122,151 to Saito et al. in view of U.S. Patent Number 5,910,868 to Kurosawa et al. and U.S. Patent Number 5,995,338 to Watanabe et al. and U.S. Patent Number 6,496,338 to Hasegawa et al.

This rejection is predicated on the previous rejection discussed above in argument VI and suffers from the same defects that were mentioned above.

In addition, the Examiner's Answer argues that different antiferromagnetic layer compositions "necessarily" have different blocking temperatures. Appellants respectfully disagree. As a matter of simple logic, blocking temperatures for different materials are not necessarily different.

Moreover, should the antiferromagnetic layers of Hasegawa et al. be used in place of the layers of Saito et al. as proposedly modified by Kurosawa et al. and Watenabe et al. the resulting structure would not have a "second nonferromagnetic layer adjoining said second and third ferromagnetic layers" as recited in claim 1, from which claim 5 depends. Further, should the antiferromagnetic layers of Hasegawa et al. be used in place of the layers of Saito et al. as proposedly modified by Kurosawa et al. and Watenabe et al. the resulting structure would not have "a ferromagnetic bias layer exchange coupled to

a portion of said free layer by a nonferromagnetic layer" as recited in claim 11, from which claim 13 depends.

VIII. Claims 6, 7 and 9 are not unpatentable under 35 U.S.C. §103(a) as being obvious over U.S. Patent Number 6,122,151 to Saito et al. in view of U.S. Patent Number 5,910,868 to Kurosawa et al. and U.S. Patent Number 5,995,338 to Watanabe et al. and U.S. Patent Number 6,396,734 to Ishikawa et al.

As noted above, the modification proposed by the Examiner of Saito et al. in view of Kurosawa et al. and further modified in view of Watanabe et al. would thwart an object of Saito et al. by breaking the ferromagnetic exchange coupling and so would not have been attempted by one of ordinary skill in the art, and because Ta would not function as an exchange coupling layer would be materially different than the claims on Appeal.

In addition, as noted in the Appeal Brief, one of ordinary skill in the art would have recognized other disincentives to making the modification proposed by the Final Rejection. The Examiner's Answer does not offer any reasoning to rebut these disincentives. Instead, the Examiner's Answer states:

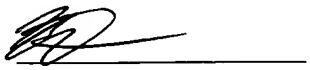
> The Examiner acknowledges appellants arguments that the alleged modification would either not work or possess a decreased sensitivity, but appellants have provided no *evidence* of record supporting the alleged position. As such, since the prior art teaches and recognizes comparable structures as pinned magnetic layers and the Examiner deems there is sound basis for the position that such a structure would work absent evidence to the contrary.

In addition to the arguments earlier stated for this issue, Appellants respectfully disagree with the Examiner's position that Appellants need to provide *evidence* whereas the Examiner can simply assert that a grab bag of references make the claims on appeal obvious, despite Appellants' showing of why the references would not be combined or modified by one of ordinary skill in the art, and if they were combined or modified would be different than the claims on Appeal. For this issue also, the Examiner has failed to present a prima facie case of obviousness.

Conclusion

Appellants have responded to the Examiner's Answer by providing additional reasons why the claims on Appeal are allowable and the Examiner's rejections should be reversed. This Reply Brief is being submitted in triplicate.

Respectfully submitted,



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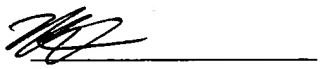

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